

March 16, 2000

Mr. R. A. Mellor  
Vice President - Operations and Decommissioning  
Connecticut Yankee Atomic Power Company  
362 Injun Hollow Road  
East Hampton, CT 06424-3099

SUBJECT: NRC INTEGRATED INSPECTION REPORT 50-213/99-04

Dear Mr. Mellor:

On February 18, 2000, the NRC completed an inspection at the Haddam Neck Plant. The enclosed report presents the results of that inspection.

During the fourteen-week period covered by this inspection, your conduct of activities at the Haddam Neck facility was characterized by the continuation of radiological work and completion of several decontamination and dismantlement activities. Your conduct of activities associated with control of radiological work at Haddam Neck was generally characterized as careful and thorough.

Effective programs were observed for 1) the activation of your Spent Fuel Pool Island, 2) the removal of the pressurizer and steam generator lower assemblies, and 3) the surveillance and dismantlement of an onsite building. Also, your Y2K program was very thorough, well documented and supported your readiness for Y2K.

Nevertheless, we noted an increasing trend in the number of self-identified problems regarding work performance. The Stop Work Order by your Decommissioning Operations Contractor (DOC) on February 2, 2000, and corrective actions taken as part of that stand-down addressed the issues related to radiation protection procedural compliance. Worker performance and effectiveness of your corrective actions will continue to be evaluated during future inspections.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of an NRC requirement occurred during this inspection period. This violation concerns the failure by plant personnel to follow radiation control procedures during reactor vessel segmentation work and reactor coolant pipe cuts. The violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII. B.1 of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or severity level of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Mr. R. A. Mellor

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In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if you choose to provide one) will be placed in the NRC Public Document Room (PDR).

Sincerely,

**/RA/**

Ronald R. Bellamy, Chief  
Decommissioning and Laboratory Branch  
Division of Nuclear Material Safety

Docket No. 50-213  
License No. DPR-61

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NRC Inspection Report No. 50-213/99-04

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REGION I

Docket No.: 50-213

License No.: DPR-61

Report No.: 50-213/99-04

Licensee: Connecticut Yankee Atomic Power Company (CYAPCO)  
P. O. Box 270  
Hartford, CT 06141-0270

Facility: Haddam Neck Station

Location: Haddam, Connecticut

Dates: November 13, 1999 to February 18, 2000

Inspectors: Joseph Nick, Enforcement Specialist  
Marie Miller, Senior Health Physicist  
John Wray, Health Physicist

Approved by: Ronald Bellamy, Chief, Decommissioning and Laboratory Branch  
Division of Nuclear Materials Safety

## EXECUTIVE SUMMARY

### Haddam Neck Station NRC Inspection Report No. 50-213/99-04

This routine inspection included aspects of licensee activities regarding dismantlement and decommissioning of the facility. The report covers a fourteen-week period of inspection by regional NRC personnel, and includes reviews and assessments of spent fuel safety, decommissioning performance, and plant support activities. There were also three meetings between NRC management and senior licensee management during this period regarding the status of activities and future plans with respect to dry cask storage and license termination.

#### **Spent Fuel Pool Safety:**

The licensee activated the Spent Fuel Pool Island (SFPI) after completion of system testing and design modification reviews. The new control room is adequately staffed and is being operated in accordance with Technical Specifications.

The inspection of spent fuel assemblies for structural defects was well planned and coordinated, and conducted with good procedural controls and management oversight.

CYAPCo had a Y2K Project Plan for the Haddam Neck nuclear facility that incorporated NRC and industry guidance as prescribed in NRC Generic Letter 98-01. Vendor certification and acceptance testing for embedded devices were conducted for all high risk dates through the next two leap years. CYAPCo declared their facility Y2K ready on December 16, 1999. The licensee experienced no Y2K related issues on December 31, 1999.

#### **Decommissioning Performance:**

The licensee conducted steam generator lower assembly (SGLA) removal in a safe and compliant manner. Preparations for removal of the pressurizer were well planned and appropriately addressed the significant levels of alpha contamination in the surge line.

The demolition and removal of the old security building was well planned, coordinated, and implemented. Survey results indicated that no detectable radioactive material was released to the environment in debris from the dismantled building.

The licensee identified several examples of poor radiation protection work practices during the decommissioning/dismantlement work in some radiological areas that led to a stop of all dismantlement activities in radiological areas. These failures to follow radiation control procedures constituted a Severity Level IV violation of NRC requirements. A detailed assessment and corrective action plan were developed by the Decommissioning Operations Contractor (DOC), and reviewed by the licensee before restarting the work activities. Effective and timely corrective actions, including good use of oversight personnel during the appropriately slow implementation of the back-to-work plan were taken to prevent recurrence.

**Plant Support and Radiological Controls:**

Effective radiological controls were observed during the work activities. Appropriate caution was used during an inadvertent event with airborne contamination in the containment building. The licensee continued to effectively monitor and control workers' radiation exposure during dismantlement/decommissioning activities. The total dose to workers at the Haddam Neck plant in 1999 was below the goal established by the licensee.

The licensee conducted an adequate exercise in accordance with the Defueled Emergency Plan (DEP). The licensee's self assessment was noted as an exercise strength.

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## **REPORT DETAILS**

### **Summary of Facility Activities**

The plant was maintained in a permanently shutdown condition during this inspection period. The licensee completed turnover of the plant and supporting functions to Bechtel, their DOC. Dismantlement and removal of major plant equipment and structures continued with removal of the steam generator lower assemblies and pressurizer, reactor coolant piping and demolition of the old security building.

## **I. Decommissioning Operations**

### **O1 Conduct of Operations**

#### **O1.1 Activation of Spent Fuel Pool Island (SFPI)**

##### **a. Inspection Scope (71801)**

The inspector reviewed the licensee's implementation of Amendment 195 to the Haddam Neck license which became effective December 16, 1999. In addition, the inspector examined results of operability tests on the Spent Fuel Building (SFB) Ventilation and Effluent Monitoring Systems completed prior to system activation.

##### **b. Observations**

The licensee activated the SFPI on December 16, 1999, with the implementation of Amendment 195 to the Haddam Neck operating license. The inspector reviewed operability tests on the SFB ventilation system and reviewed new control room readiness. The inspector verified that the system flows and pressures met established acceptance criteria specified in Special Procedure ST 11.7-24 entitled "Spent Fuel Building Ventilation System Test". During this inspection a walk-down of the spent fuel building was completed to verify adherence to minor modification (MMOD) 98535, "Spent Fuel Building Ventilation". No discrepancies were identified.

A new control room was activated and the inspector verified that system monitoring equipment was functional and operating in a satisfactory manner. Interviews were conducted with on-shift operations personnel and all workers appeared to be knowledgeable in the new Technical Specification (TS) requirements. The remote monitoring equipment gave very good real time data on fuel building systems. The inspector concluded that the new control room was adequately manned with trained personnel and fully capable of controlling operations as specified in TSs.

##### **c. Conclusions**

The licensee activated the SFPI after completion of system testing and design modification reviews. The new control room is adequately staffed and is being operated in accordance with TSs.

## O1.2 Spent Fuel Inspections

### a. Inspection Scope (60710)

The licensee initiated visual inspections of spent fuel assemblies in the spent fuel pool (SFP) to determine if interferences exist which would prohibit placement of any assembly in canisters used for dry cast storage. The inspector observed the fuel inspection activities and reviewed licensee controls.

### b. Observations

The licensee is evaluating the feasibility of on-site dry spent fuel storage. A first step in the process is to examine each of the 1019 spent fuel assemblies in the SFP to determine if interferences exist which would prevent them from being placed in an approved canister. The licensee initiated a visual inspection of their spent fuel assemblies on January 19, 2000, using remote underwater cameras and tape recording devices. The inspector reviewed the operation during the initial week of visual inspections. Appropriate controls were established to ensure correct handling of the assemblies. Interviews with the on-shift certified fuel handlers indicated that personnel were knowledgeable in procedural requirements and showed good control of the work evolutions. Health physics personnel were monitoring dose rates on the fuel handling bridge as the assemblies were raised and lowered. Monitoring of the SFP water purification system was also ongoing and was adequate to assure general dose rates did not increase excessively. Communications were good between the certified fuel handlers and the control panel personnel. Management oversight was observed. No violations were identified.

### c. Conclusions

The inspection of spent fuel assemblies for structural defects was well planned and coordinated, and conducted with good procedural controls and management oversight.

## O1.3 Y2K Readiness

### a. Inspection Scope (TI 2561/003)

To confirm that the facility had adequately addressed Y2K computer issues, specific program areas were reviewed against the guidance specified in Temporary Instruction 2561/003, dated November 30, 1999.

### b. Observations

#### Management Planning

The licensee developed a facility and corporate Y2K management plan, which identified the approach, objectives, resources and quality assurance requirements. The project plan included a Project Manager (CYAPCo Controller) and members of her staff, Subject Matter Experts, and vendor support for Information Technology, documentation of project results, and independent audits.

#### Documentation

The licensee used applicable existing facility procedures for design change, testing, and quality assurance (QA) surveillance. However, a documentation process was developed specifically for the Y2K project, including records for initial and detailed assessments, remediation of components, if necessary, and for vendor certifications.

#### Y2K Project Plan

The licensee had an approved plan that incorporated guidance as prescribed in NRC Generic Letter 98-01 and industry guidance NEI/NUSMG 97-07, which was designed for operating nuclear power facilities. An extensive database was generated that documented the inventory of 23,000 components, including a detailed evaluation of 65 embedded devices.

#### Y2K Program Implementation Activities

Specific Y2K program evaluations were reviewed for maintaining the spent fuel pool water level monitor, temperature monitor and control room read-outs; intrusion detection for the SFB; and radiation monitoring system for the SFB ventilation. Interviews were conducted with the Y2K Project Manager, Control Room monitor design engineer and the security manager. Results of this review include the following:

- The licensee correctly classified and analyzed hardware and software for Y2K vulnerability. Vendor certification information was available and reviewed by cognizant personnel.
- Instructions, worksheets and criteria were established and used to assess components related to the above areas. For example, it was known the existing radiation monitoring system was not Y2K compliant and this issue was tracked until the new ventilation system modification was installed and the amended TSs were approved and implemented.
- Vendor certifications were generally accepted for software and hardware components that did not have embedded devices. For components with embedded devices, specific test procedures were developed. The security computer software factory acceptance test included high risk dates through the next two leap years. Test data for specific alarms documented appropriate date rollovers.
- All systems related to safe spent fuel storage were considered Y2K ready. No remediation was necessary for existing systems, because they were replaced.
- Contingency plans were developed for security, the SFPI and for facilities transferred to the licensee's DOC.

## Contingency Plans for External Hazards

The contingency plan for loss of offsite electric power included manually loading the Control Room, SFB and Security systems to an emergency diesel generator. A dedicated Uninterruptible Power Supply (UPS) is also available to the Control Room and the security computer with ample time to allow for manually loading to the emergency diesel generator. The inspector discussed with the Security Manager a previous concern regarding the availability of emergency power for security loads (Unresolved Item (URI) 98-05-04). The installed and dedicated UPS in the new Control Room provides sufficient capability to address the licensee's defueled security plan. While this UPS system was not available in 1998, adequate compensatory measures were taken at the time. The adequacy of the compensatory measures were discussed between the licensee and an NRC regional security specialist during a telephone conversation on January 25, 1999. **URI 98-05-04** is closed.

The contingency plan for loss of external communications is the same as in the Defueled Emergency Plan, including NU paging system, radios and dedicated land lines. Specific personnel are directed to staff facilities if unable to make contact within one hour. Specific contingency plans were developed for pre-December 31, 1999 actions, including topping off consumables, additional on-shift staff, and fitness-for-duty testing.

### c. Conclusions

CYAPCo had an Y2K Project Plan for the Haddam Neck nuclear facility that incorporated NRC and industry guidance as prescribed in NRC Generic Letter 98-01. Vendor certification and acceptance testing for embedded devices were conducted for all high risk dates through the next two leap years. CYAPCo declared their facility Y2K ready on December 16, 1999. The licensee experienced no Y2K related issues on December 31, 1999.

## **O8 Miscellaneous Operations Issues**

(Closed) Unresolved Item 97-01-03: Inaccurate Operator Training Records. This item was reviewed by an NRC operating training specialist during an inspection (50-213/99-01) of the licensee's actions in response to an NRC Confirmatory Action Letter dated March 7, 1997. The inspector confirmed that the required training program was in effect until the TS change in March 1998, when the certified fuel handler program began. This item is considered closed.

(Closed) Inspector Follow-up Item 97-05-04: Actions to Address NRC Bulletin 94-01. The licensee had addressed the actions specified in Bulletin 94-01 by letter dated February 20, 1998. Engineering Procedure 1.7-175, "Fuel Pool Leakage Monitoring," dated November 11, 1998 requires monthly trending of pool make-up data and annual review of test well data for tritium. The inspector determined that adequate procedures are in place to monitor the SFP water level and to trend SFP leakage. This item is closed.

## II. Decommissioning Status

### **O.2 Decommissioning Status of Facilities and Equipment**

#### **O2.1 Major Equipment Dismantlement**

##### **a. Inspection Scope (71801)**

The inspector evaluated the licensee's status of decommissioning work through discussions with cognizant licensee personnel and observations of major equipment dismantlement activities.

##### **b. Observations**

The inspector observed selected activities with respect to the removal of the lower sections of the steam generators. Good pre-job briefings were conducted for the crews involved with the lifts. The inspector observed good communication on the charging deck during the lifts. Health physics personnel were controlling access to areas based on dose rate readings. The inspector noted adequate QA involvement during the steam generator bowl inspection and cleaning. Moisture and free-standing water were suctioned off to ensure that the SGLA satisfied burial site and Department of Transportation (DOT) requirements. Good health physics coverage was observed during welding of cover plates over reactor coolant system (RCS) pipe openings. Radiation beams up to 10 R/hr were avoided to minimize personnel exposures to radiation. Extremity dosimetry was used where appropriate. No violations were identified.

The inspector also reviewed the preparations for the removal of the pressurizer, including procedure SPL10.11-47, "Pressurizer Removal". The inspector observed the pre-job briefing for work crews. The briefing addressed both radiological and occupational work hazards. The inspector observed that the workers wore safety harnesses and floor openings were barricaded. A portion of the surge line was contaminated to levels in excess of several thousand disintegrations per minute of alpha contamination. The piping had been wrapped and shielded. Because of this earlier identified contamination, air sampling was in force for any grinding, pinging or cutting. No concerns were identified.

With the dismantlement of large major components, the inspectors have made several observations with respect to addressing an unresolved item regarding procedural guidance for rigging heavy loads. In addition to purchasing a new lifting rig, all site riggers attended the 40 hour training on rigging given at the Millstone site. An Engineering Memo also specified lifting point components and preferred lift methods. The inspectors observed good practices during lifts of heavy loads. **URI 98-04-04** is closed.

##### **c. Conclusions**

The licensee conducted SGLA removal in a safe and compliant manner. Preparations for removal of the pressurizer were well planned and appropriately addressed the significant levels of alpha contamination in the surge line.

## O2.2 Building Dismantlement

### a. Inspection Scope (71801)

The inspector observed the dismantlement of the old security building and reviewed survey records for compliance to release limits for unrestricted use.

### b. Observations

The old security building was dismantled during the week of January 17, 2000. The licensee used Electra 1B and HP-210 radiation detectors to survey walls and floors. Particular attention was directed to the building roof. One hundred percent of the floors were direct frisked as well as the walls up to six feet. The licensee also direct frisked the exterior walls up to six feet and radiologically assessed ventilation ducts, electrical penetrations, and open drains. Smear surveys for removable contamination were also performed. A composite sample of roof material was obtained and analyzed in the licensee's count room. The inspector reviewed a report entitled "Old Security and Fitness Center Building Radiological and Hazardous Material Characterization Report CY-CR-99-003" and determined that it was complete and thorough.

Survey results and sample analyses were reviewed and no radioactive material above background was identified. Since the licensee had not submitted a License Termination Plan at the time of this building dismantlement, plant procedures for release of radioactive materials from the site controlled this operation. The inspector examined procedure RPM2.2-22, "Vehicle and Material Release from Radiologically Controlled Area", Revision 0, dated November 4, 1999, and concluded that adequate controls were being applied to ensure that no detectable radioactive material would be released with material from the dismantled building. Survey results were complete. Instruments used were correctly calibrated and source-checked daily. The inspector coordinated with a State DEP representative to perform an independent survey of the building roof. No radioactive material was detected.

### c. Conclusions

The demolition and removal of the old security building was well planned, coordinated, and implemented. Survey results indicated that no detectable radioactive material was released to the environment in debris from the dismantled building.

## O2.3 Condition Reports

### a. Inspection Scope (40801)

The inspector reviewed the licensee's corrective action program to determine the licensee's effectiveness in identification and resolution of problems and adverse conditions.

b. Observations

During the early portion of this inspection period, the licensee initiated a number of condition reports (CRs) for work not performed in accordance with radiation work permits (RWPs), the station tagging program, and effluent sampling procedures. Although individually each item was of minor safety significance, the inspector informed the licensee that this increasing trend of poor work practices was of concern and that the NRC would continue to more closely review work performance. During a later portion of this inspection period, the inspector noted that the licensee had identified several new examples of poor radiation work practices which were more radiologically significant.

On February 2, 2000, the workers in containment removed a tool from the reactor cavity water without a health physics technician present to monitor for contamination. The health physics technician found the workers holding the tool after returning from a brief task. The technician also determined that the tool was not rinsed as it was removed from the water. This was a violation of the radiation work permit (RWP#00-127, task 3) and the Radiation Safety Review (RSR#00-09). There were no personnel contaminations from this event and contamination controls were immediately established by the technician. The licensee initiated a condition report (CR 00-105) and implemented corrective actions to prevent a recurrence.

A second example of poor radiation protection work practices involved the cutting of Component Cooling Water (CCW) system piping and components in the Primary Auxiliary Building (PAB). On February 2, 2000, workers performing demolition of the CCW system did not have a health physics technician present to monitor radiological conditions as they cut open the CCW water pipe and valve. This was a violation of the RWP. The workers were in a clean (non-contaminated) area and were not wearing appropriate protective clothing in the event they inadvertently spread contamination. The licensee initiated a condition report (CR 00-106) and stopped the work until corrective actions were implemented.

Another incident occurred on February 2, 2000, and resulted in a personnel contamination. Workers in containment were cutting and removing pieces of RCS piping with significant internal contamination. The workers were instructed not to work on the inside of the pipe without further specific radiological controls. However, a worker tried to remove a burr from the inside of the pipe without notifying the health physics technician. This work on the inside of the pipe resulted in airborne contamination and spread of contamination to the workers. After the contamination was identified on the worker, immediate actions included initiating a bioassay of the individual and a co-worker and surveys of the work area. The licensee initiated a condition report (CR 00-109) and stopped the work until corrective actions were implemented.

Due to several problems with worker adherence to procedures within a short time period, on February 2, 2000, the DOC stopped all decommissioning and dismantlement work in radiological areas (except for routine surveillance activities and fuel inspection activities). The work stoppage was ordered so that the licensee and DOC management could plan and implement corrective actions to prevent recurrence. Workers and management openly discussed problem areas and recommendations for resolution of issues. They determined that a lack of effective communication between work groups was a root cause in all of the recent incidents.

As a result of the licensee's review, corrective actions and a start-back-to-work plan were developed. Corrective actions included the following: 1) initiation of a review of RWPs, RSRs, and work requests for each task to ensure that important hold points are incorporated in all work planning documents; 2) communication of management expectations to all employees regarding communications between work groups, understanding of the job, stopping work for any changing condition, and accountability of workers and consequences for not adhering to procedures or instructions; 3) holding pre-job briefing sessions with all crew members, the assigned HP technician, and the job supervisor; 4) training for HP technicians and job supervisors in effective briefing techniques; and 5) emphasizing to workers the importance of self-assessment.

Longer term corrective actions include adequate resources for job coverage, utilization of video monitoring of work in progress, enhancement of the current job briefing by combining the work task briefing with the radiological briefing, implementation of a change to the work planning process to include a required radiological engineering input, and initiation of a culture change for workers to question unsafe conditions and stop the work when it is necessary to ensure safety.

On February 4, 2000, the licensee was ready to restart work according to a planned and prioritized schedule. The higher priority jobs were started one at a time, after ensuring that the corrective actions had been taken for each job. Approximately twenty oversight personnel performed direct observation and assessment of the pre-job planning, the pre-job briefing, and the actual work in the field. These oversight personnel provided good feedback and ensured that the work progressed safely. The inspector noted that the start-back-to-work plan was implemented in a slow, deliberate process that helped to ensure the safety objectives were achieved.

The inspector observed work planning and briefing for the RCS piping removal work starting on February 9, 2000. The inspector noted good use of oversight personnel in work planning and preparation. Good use of health physics personnel in the pre-job briefing was also noted. The inspector also observed work performance in the field and noted good radiological work practices and adherence to the job requirements for the reactor vessel internals segmentation, the RCS piping removal, and the CCW system removal.

The inspector did not identify any additional radiological control issues that had not been identified by the licensee. However, as discussed above, the three examples of the procedural non-compliance were of radiological significance and are considered violations that represent a Severity Level IV problem. However, the issue is being treated as a Non-Cited Violation in accordance with Section VII.B.1 of the NRC Enforcement Policy. This violation is recorded in the licensee's corrective action program as CR 00-105, CR 00-106, and CR 00-109.

**(NCV 99-04-01)**

c. Conclusions

The licensee identified several examples of poor radiation protection work practices during the decommissioning/dismantlement work in some radiological areas that led to a stop of all dismantlement activities in radiological areas. These failures to follow radiation control procedures constituted a Severity Level IV violation of NRC requirements. A detailed



assessment and corrective action plan were developed by the DOC, and reviewed by the licensee before restarting the work activities. Effective and timely corrective actions, including good use of oversight personnel during the appropriately slow implementation of the back-to-work plan were taken to prevent recurrence.

### **III. Plant Support and Radiological Controls**

#### **R1 Radiological Protection Controls**

##### **R1.1 Radiological Exposure Controls**

###### **a. Inspection Scope (83750)**

The inspector reviewed the licensee's program to monitor and control radiation exposure to employees, including health physics coverage of jobs in radiologically controlled areas (RCAs) and annual dose reports.

###### **b. Observations**

The inspectors observed work in radiological areas to determine whether proper radiological controls were being implemented and workers were adhering to safety requirements. Workers in the PAB and containment were observed using good radiological practices. Health physics technicians were providing good job coverage and implementing good radiological controls to minimize radiation exposure and the spread of contamination. The work in the PAB on the CCW system was changed to incorporate contamination controls (protective clothing, contaminated areas, frisking requirements) into the work activities so that a health physics technician was not required during breaches of the CCW piping and components.

Contrary to the deficient worker performance with respect to procedure non-conformance, as documented in Section O2.3 of this report, generally the health physics technicians demonstrated good performance with respect to implementation of the radiation control procedures. Violation (VIO) 97-06-01 was one of several concerns, which had documented the failure of plant radiation protection personnel to follow procedures. Specifically, it identified the failure to conduct adequate radiological surveys during diver activities. Based on the multiple examples of recent good performance by the health physics technicians and the upgrades taken as part of the Radiation Protection Improvement Program (RPIP), **VIO 97-06-01** is closed.

The inspector observed during several tours of the RCA Access Point adequate surveys of equipment leaving the RCA. Escalated Enforcement Item (EEI) 98-05-03 identified the failure to survey contaminated video equipment prior to its release in 1997. The licensee implemented new survey requirements as part of the RPIP. Based on these observations and the improvements in survey equipment and procedures, **EEI 98-05-03** is closed.

On February 9, 2000, at about 8:00 PM, an airborne radioactivity monitor alarmed in containment and the licensee stopped work to investigate the source. The actual airborne radioactivity levels were found to be 1 to 2 DAC. The highest internal dose was approximately

5 millirem. The levels appeared to slowly decline throughout the night and were almost normal the next morning. The licensee determined that the elevated airborne radioactivity was due to the underwater cutting of bolts using the Mechanical Disintegration Machining (MDM) process. Although a ventilation hose was positioned above the surface of the water directly over the cutting area, the licensee also determined that a larger capture device was required to prevent the higher levels of radioactivity in the air. No personnel contaminations or internal dose were attributed to the airborne radioactivity. The inspectors noted that the licensee took appropriate caution in stopping the work and determining the source of radioactivity before resuming work on February 10, 2000.

The occupational radiation exposure to all monitored workers at the Haddam Neck Plant for 1999 was 110.5 person-rem. During the first half of 1999, CY monitored the total worker radiation exposure against a revised goal of 21.4 person-rem, which was based on the percentage of work that was actually completed. The actual dose to CY employee's and contractors during the first six months of 1999 was 19.7 person-rem or about 92% of the goal.

As part of the Bechtel work contract, total radiation exposure for the second half of 1999 was calculated separately for CY work activities and Bechtel activities. The CY goal for the second half of 1999 less than 6.7 person-rem. The actual radiation dose to workers for CY's work activities was 1.4 person-rem (approximately 21% of the goal). The working goal for Bechtel's work activities was less than 140 person-rem. The actual radiation dose to workers for Bechtel's work activities was 89.4 person-rem (approximately 64% of the goal).

The licensee had also calculated that workers performing post-shutdown decommissioning activities report (PSDAR) activities had a total dose of approximately 230 person-rem since permanent cessation of operations .

c. Conclusions

Effective radiological controls were observed during the work activities. Appropriate caution was used during an inadvertent event with airborne contamination in the containment building. The licensee continued to effectively monitor and control workers' radiation exposure during dismantlement/decommissioning activities. The total dose to workers at the Haddam Neck plant in 1999 was below the goal established by the licensee.

**P1 Conduct of Emergency Preparedness (EP) Activities**

P1.1 Review of Exercise Objectives and Scenario (82302)

The inspector reviewed the 1999 exercise objectives and scenario, which was developed by the licensee to exercise major elements of the licensee's defueled emergency plan (DEP). The scenario was based on a loss of SFP cooling with a low level release of radioactive noble gas resulting from significant damage to the SFB. The scenario also included dispatching a Search and Rescue Team for an unaccounted individual in the SFB. This scenario provided an adequately challenging framework to support demonstration of the licensee's DEP procedures and defueled emergency response organization (DERO).

P1.2 Evaluation of Defueled Emergency Preparedness Exercise

a. Inspection Scope (82302)

The inspector observed and evaluated the licensee's DEP exercise and self-critique to assess the licensee's implementation of their EP program and procedures.

b. Observations and Findings

The inspector reviewed the implementation of the DEP by reviewing specific activities in the Monitoring Control Room and the Technical Support Center (TSC). The inspector observed that the shift organization had sufficient knowledge of the emergency and operations procedures and performed the required emergency functions, including emergency assessment, classification, and notification for activation of the DERO all within the response goal time of one hour. In addition, the inspector discussed with the Operations Shift Manager the assessment and classification scheme for emergency classification. The inspector also reviewed the corrective actions taken in response to the violation in 1998, when the licensee failed to appropriately classify an inadvertent release of radioactive liquid as an Unusual Event. The inspector determined that the emergency classification procedures addressed unplanned liquid releases and the licensee staff demonstrated adequate knowledge of emergency classification during the exercise. **VIO 98-03-01** is closed.

The TSC was activated and staffed in accordance with the DEP response timeliness goals and performed the emergency functions of radiological dose assessment, dispatch of a search and rescue and repair team, and communications. The inspector noted that search and rescue teams were dispatched with better coordination and timeliness than the 1998 exercise. The Emergency Director received periodic briefings from his key managers, however, the Emergency Director did not recognize that there was a minimal noble gas release from the SFB. The gaseous release was therefore not included in the press release or in updated information. Because the release was not significant radiologically, it had no impact with respect to onsite or offsite dose assessment and protective actions. The new SFB monitor was placed into service that week, and it was discussed that the nomenclature for the monitor was not recognized by all members of the DERO as an effluent monitor.

The inspector observed the licensee's player and controller critique following the exercise and received a briefing regarding the management critique held the following day. The inspector found that the licensee's self-assessment was very thorough and noted that the licensee identified the same issues that were observed by the NRC. All licensee exercise objectives were met and previously identified areas for improvement were corrected.

c. Conclusions

The licensee conducted an adequate exercise in accordance with the DEP. The licensee's self assessment was noted as an exercise strength.

## **IV. Management Meetings**

### **X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management periodically during the inspection, and during a teleconference with Mr. K. Heider and others on February 16, 2000. The licensee acknowledged the findings presented by the inspector. The inspector reviewed with the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

### **X2 Management Meetings**

On December 1, 1999, Ronald Bellamy, Chief, Decommissioning and Laboratory Branch and Commissioner Jeffrey Merrifield met with senior representatives from CYAPCo, Bechtel management and members of the public to discuss the decommissioning activities at the station.

NRC staff attended Community Decommissioning Advisory Committee (CDAC) meetings on November 16, 1999, and January 18, 2000.

NRC conducted a meeting with licensee management representatives at the site on January 19, 2000, to discuss the licensee's planned submittal of their License Termination Plan. George Pangburn, Director of the Nuclear Materials Safety Division, Region I, was in attendance. This meeting was open for public observations and questions from the public were entertained at the conclusion of the meeting.

On January 27, 2000, George Pangburn and Ronald Bellamy and other regional, NRR, and NMSS staff met with senior representatives from CYAPCo at the NRC RI office, which was open for public observation. The licensee provided an overview of decommissioning activities including the transition to their DOC, implementation of the CYAPCo oversight organization, dry cask storage plans, status of dismantlement and demolition activities and a summary of their employee concerns program. Attached are the slides from this presentation.

## **PARTIAL LIST OF PERSONS CONTACTED**

G. Bouchard, (Former) Unit Director (retired from CYAPCo)  
\*J. Bourassa, Nuclear Safety Manager  
\*M. Cavanaugh, Communications Manager  
P. Dadlani, Project QA Manager, Bechtel  
\*N. Fetherston, Construction Oversight Manager  
J. Haseltine, (Former) Strategic Planning Director  
P. Hollenbeck, Site Characterization Supervisor  
M. Hornyak, Supervisor - Corrective Actions  
\*K. Heider, Site Manager  
\* P. K. Jackson, Assistant Project Manager, Bechtel  
D. Karr, Quality Assurance Supervisor  
J. Kelly, Radioactive Waste Supervisor - Duratek  
\* S. Kumar, Regulatory Affairs  
\* R. McGrath, Radiological Engineering Supervisor  
R. Mellor, Vice President Operations and Decommissioning  
R. Miller, Project Manager, Bechtel  
\* R. Mitchell, Unit Manager  
E. Mullarkey, Decommissioning Project Manager  
\*G. van Noordennen, Regulatory Affairs Manager  
F. Perdomo, Regulatory Affairs  
S. Pornprasert, Oversight Engineer  
\*R. Prunty, Licensing, Bechtel  
C. Pizzella, Y2K Program Manager  
D. Scribner, Project Engineer, Bechtel  
R. Sexton, Safety Oversight Manager  
\*B. Smith, Licensing, Bechtel  
J. Tarzia, Radiation Protection and Chemistry Manager, Bechtel  
T. Troutman, Transition Manager, Bechtel  
\* S. Webster, Licensing, Bechtel  
R. Willis, Assistant Operations Manager

\* Denotes attendance at the telephone exit meeting held on February 16, 2000.

## **INSPECTION PROCEDURES USED**

IP 40801: Self Assessment, Audits and Corrective Actions  
IP 60710: Fuel Handling Activities  
IP 71801: Decommissioning Performance and Status Review  
IP 82302: Evaluation of Exercises (EP)  
IP 83750: Occupation Radiation Exposure Controls  
TI 2561/003: Y2K Readiness Review

## ITEMS OPEN, CLOSED, AND DISCUSSED

### Open

99-04-01	NCV	Failure to Follow Radiation Protection Procedures
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### Closed

97-01-03	URI	Inaccurate Operator Training Records
97-05-04	IFI	Actions to Address Bulletin 94-01
97-06-01	VIO	Failure to Follow Health Physics Procedures
98-03-01	VIO	Failure to Classify Unusual Event
98-04-04	URI	Actions to Address Weaknesses in Rigging Program
98-05-03	EEL	Failure to Survey Contaminated Equipment Prior to Release
98-05-04	URI	Availability of Security Emergency Power
99-04-01	NCV	Failure to Follow Radiation Protection Procedures

## LIST OF ACRONYMS USED

CCW	Component Cooling Water
CDAC	Community Decommissioning Advisory Committee
CFR	Code of Federal Regulations
CR	Condition Report
CYAPCo	Connecticut Yankee Atomic Power Company
DEP	Defueled Emergency Preparedness
DEP	Defueled Emergency Plan
DERO	Defueled Emergency Response Organization
DOC	Decommissioning Operations Contractor
DOT	Department of Transportation
EP	Emergency Preparedness
I&C	Instrument and Control
IR	Inspection Report
MDM	Mechanical Disintegrations Machining
MMOD	Minor Modification
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
PAB	Primary Auxiliary Building
PDR	Public Document Room
PSDAR	Post Shutdown Defueled Activities Report
QA	Quality Assurance
RCA	Radiologically Controlled Area
RCS	Reactor Coolant System
RP	Radiation Protection
RPIP	Radiation Protection Improvement Plan
RSR	Radiation Safety Review
RWPs	Radiation Work Permits
SFP	Spent Fuel Pool
SFPB	Spent Fuel Pool Building
SFPI	Spent Fuel Pool Island
SGLA	Steam Generator Lower Assembly
TS	Technical Specifications
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
UPS	Uninterruptible Power Supply
Y2K	Year 2000